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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,360	10/31/2003	Eric S. Olson	TCOM0012	5403

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EXAMINER	
MALEK, LEILA	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/699,360	OLSON ET AL.	
	Examiner	Art Unit	
	Leila Malek	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,12-21,24-29 and 32* is/are rejected.

7)☒ Claim(s) *10,11,22,23,30 and 31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/13/2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicants' argument filed on 10/26/2007 has been fully considered but it is not persuasive.

Applicants' Argument: Applicant argues that Madhow teaches that the matrix has a dimension equal to the number of interference vectors being suppressed. However, the matrix taught by applicants' invention would have a dimension of one.

Examiner's Response: Examiner asserts that Madhow discloses the number of columns in the interference subspace matrix are equal to the set of interference vector (see column 6, line 66 – column 7, line 1). Madhow does not specify the number of rows of this matrix. Furthermore, it is noted that the features upon which applicant relies (i.e., the number rows or columns of the matrix) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-9, 12-14, 16- 21, 24-29, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Madhow et al. (hereafter, referred as Madhow) (US 6,175,587), in view of Affes et al. (hereafter, referred as Affes) (US 6,975,666).

As to claim 1, Madhow discloses a demodulator unit (see Fig. 2 (220)) configured for demodulating one or more of a plurality of signals (see Fig. 2); and a processing engine 400 (see Figs. 3 and 4) communicatively coupled to the demodulator unit (Fig. 2 (220)) and configured for generating a matrix of one or more interference vectors (column 6, column 7, lines 1- 5, 16-37, column 8, lines 10-13), wherein each of vectors comprises a component of an interfering signal (column 9, lines 31-67, column 10, lines 1-6) and wherein the matrix is used to selectively substantially reduce energy from one or more of the signals (column 6, lines 65-67, column 7, lines 29-65, column 8, lines 40-49, column 9, lines 17-26, 31-67, column 10, lines 1-6, 8-13). Madhow discloses all the subject matters claimed in claim 1, except that the matrix is a linear combination of one or more interference vectors. Affes, in the same field of endeavor, shows a receiver (see Fig. 11), comprising: a demodulator unit (see column 15, lines 31 and 32) configured for demodulating one or more of a plurality of signals (see Fig. 11, block 18); and a processing engine (see Fig. 11, block 43B) communicatively coupled to the demodulator unit and configured for generating a matrix (C_n) that is a linear combination of one or more interference vectors (see column 20, lines 44 - column 22, line 56), wherein each of the interference vectors comprises a component of an interfering signal and wherein the matrix is used to cancel the

interference from the strongest signal (see column 48, lines 6-12). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Madhow as suggested by Affes, to simplify the interference matrix and reduce the complexity of calculations (see column 23, lines 17-21).

As to claim 2, Madhow discloses a searcher finger 114 configured for selecting signals for demodulation from the plurality of signals and for determining one or more codes from selected signals (see column 4, lines 44-46 and Fig. 2).

As to claim 3, Madhow discloses that the demodulator unit comprises a plurality of demodulator fingers configured for demodulating the selected signals (see Figs. 1 and 2).

As to claim 4, Madhow further discloses that the determined codes comprise code offsets in time from one another (see column 4, lines 6-8 and column 8, lines 55-57).

As to claims 5, Affes further discloses that the matrix comprises a composite interference vector (see column 20, lines 53-55) constructed using code information and amplitude information (see column 4, lines 38-44 and column 25, lines 37-41). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Madhow as suggested by Affes to suppress the interference more effectively.

As to claim 6, Madhow further discloses that the demodulator unit is assigned to at least one of a multipath signal from a base station in soft handoff

with the mobile unit or to a strong multipath signal from a base station not in soft handoff (see column 8, lines 14-19).

As to claim 7, Madhow further discloses that a radio frequency front end configured for receiving the signals (column 4, lines 26-31).

As to claim 8, Madhow further shows (see Fig. 4 (402,404)) that the processing engine comprises a channel selector configured for selecting components of the determined codes from signals selected for energy reduction (column 7, lines 29-49, column 8, lines 40-60).

As to claims 9, 21, and 29, Madhow further discloses that the processing engine is further configured to generate, a cancellation operator used to substantially reduce the energy of the signals selected for energy reduction (column 7, lines 6-33, column 8, lines 40-60, column 10, lines 3-12).

As to claim 12, Madhow further discloses that the determined codes are spreading codes (see column 3, lines 66).

As to claim 13, Affes discloses that the spreading coded used is a short code (see column 12, lines 7-13). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Madhow as suggested by Affes to make the process of interference reduction more convenient (see column 12, lines 12-13).

As to claim 14, Madhow discloses that the processing engine further correlates a despread received signal against a plurality of Walsh codes covering code is selected from a group consisting of a Walsh (see column 5, lines 34-36).

As to claims 16 and 24, Madhow discloses a demodulator unit (see Fig. 2 (220)) configured for demodulating one or more of a plurality of signals (see Fig. 2); constructing at least one interference vector (see column 6) from the at least one demodulated signal of a plurality of signals; wherein the at least one interference vector comprises components of an interfering signal (column 9, lines 31-67, column 10, lines 1-6); generating a matrix of one or more interference vectors (column 6, column 7, lines 1- 5, 16-37, column 8, lines 10-13), and using the matrix to selectively substantially reduce energy from one or more of the signals (column 6, lines 65-67, column 7, lines 29-65, column 8, lines 40-49, column 9, lines 17-26, 31-67, column 10, lines 1-6, 8-13). Madhow discloses all the subject matters claimed in claims 16 and 24, except that the matrix is a linear combination of one or more interference vectors. Affes, in the same field of endeavor, shows a receiver (see Fig. 11), comprising: a demodulator unit (see column 15, lines 31 and 32) configured for demodulating one or more of a plurality of signals (see Fig. 11, block 18); and a processing engine (see Fig. 11, block 43B) communicatively coupled to the demodulator unit and configured for generating a matrix (C_n) that is a linear combination of one or more interference vectors (see column 20, lines 44 - column 22, line 56), wherein each of the interference vectors comprises a component of an interfering signal and wherein the matrix is used to cancel the interference from the strongest signal (see column 48, lines 6-12). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Madhow as suggested by Affes,

to simplify the interference matrix and reduce the complexity of calculations (see column 23, lines 17-21).

As to claims 17 and 25, Madhow further discloses searching for one or more signals from the plurality of signals for assigning to at least one demodulating unit (see Figs. 1 and 2).

As to claims 18 and 26, Madhow discloses determining one or more codes for signals assigned to the demodulating unit selected from the plurality of signals (see Fig. 2).

As to claims 19 and 27, Affes discloses summing a plurality of the interference vectors to form a composite interference vector (see column 20). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Madhow as suggested by Affes, to simplify the interference matrix and reduce the complexity of calculations (see column 23, lines 17-21).

As to claims 20 and 28, Affes further discloses that the matrix comprises a composite interference vector (see column 20, lines 53-55) constructed using code information and amplitude information (see column 4, lines 38-44 and column 25, lines 37-41). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Madhow as suggested by Affes to suppress the interference more effectively.

As to claim 32, Madhow discloses a processing engine 400 (see Figs. 3 and 4) configured for generating a matrix of one or more interference vectors (column 6, column 7, lines 1- 5, 16-37, column 8, lines 10-13), wherein each of vectors comprises a component of an interfering signal (column 9, lines 31-67,

column 10, lines 1-6) and wherein the matrix is used to selectively substantially reduce energy from one or more of the signals (column 6, lines 65-67, column 7, lines 29-65, column 8, lines 40-49, column 9, lines 17-26, 31-67, column 10, lines 1-6, 8-13). Madhow discloses all the subject matters claimed in claim 32, except that the matrix is a linear combination of one or more interference vectors. Affes, in the same field of endeavor, shows a receiver (see Fig. 11), comprising: a demodulator unit (see column 15, lines 31 and 32) configured for demodulating one or more of a plurality of signals (see Fig. 11, block 18); and a processing engine (see Fig. 11, block 43B) communicatively coupled to the demodulator unit and configured for generating a matrix (C_n) that is a linear combination of one or more interference vectors (see column 20, lines 44 - column 22, line 56), wherein each of the interference vectors comprises a component of an interfering signal and wherein the matrix is used to cancel the interference from the strongest signal (see column 48, lines 6-12). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Madhow as suggested by Affes, to simplify the interference matrix and reduce the complexity of calculations (see column 23, lines 17-21).

3. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Madhow and Affes, further in view of Applicants' background of invention.

As to claim 15, Madhow and Affes disclose all the subject matters claimed in claim 1, except that the signals are selected from a group consisting of cdma2000 and cdmaOne signals. Applicants in the background of invention further disclose that the signals are selected from a group consisting of

cdma2000 signals and cdmaOne signals (see page 2). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Madhow and Affes as suggested by Applicant's background of invention to take advantage of higher data rates in the system.

Allowable Subject Matter

4. Claims 10, 11, 22, 23, 30, and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leila Malek whose telephone number is 571-272-8731. The examiner can normally be reached on 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Leila Malek
Examiner
Art Unit 2611

L.M.

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER